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Via Hand Delivery

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, S.W.
TW-A325
Washington, D.C. 20554

Re: **EX PARTE**
CS Docket No. 98-201

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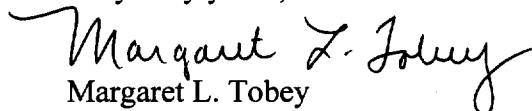
FEB - 1 1999

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Dear Ms. Salas:

Enclosed for inclusion in the above-referenced docket pursuant to Section 1.1206(b)(2) of the Commission's rules are the original and one copy of two maps and accompanying overlays which depict the results of television signal propagation predictions using the TIREM prediction methodology. Originals of these maps have been provided to the individuals identified below.

Very truly yours,



Margaret L. Tobey
Counsel for the Satellite Broadcasting and
Communications Association

Enclosures

cc: Rick Chessen
Rosalee Chiara
Bob Eckert
Donnie Fowler
Eloise Gore
Jane Mago
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DESCRIPTION OF TIREM COVERAGE MAPS

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The enclosed television Grade B coverage prediction map overlays were created by Stephen A. Fast at the Applied Research Laboratory ("ARL"), Pennsylvania State University, State College, Pennsylvania, using a recent implementation of the TIREM ("Terrain-Integrated Rough-Earth Model") computer program. The ARL has considerable experience in using TIREM for various military and civilian radio frequency studies. The version of TIREM employed by the ARL is the military version (Version 4) identified in footnote 6 of the *ex parte* submission by Larry Irving, Chief, National Telecommunications and Information Administration, dated January 29, 1999. The ARL modified Version 4 of TIREM by adding the Longley-Rice fading model (AVAR), which allowed TIREM to take into account reliability and confidence factors and which is available from public sources.¹ Mr. Irving is correct that while TIREM Version 4 is subject to export controls, it "fundamentally uses the same technical algorithms and yields similar but not identical results as Version 3," which is publicly available and not subject to export restrictions. The same Longley-Rice fading model can also be added to TIREM Version 3 to enhance its accuracy. The fundamental difference between TIREM Versions 3 and 4 is in the deep shadow region close to the earth. TIREM Version 4 has a switch algorithm that more accurately depicts areas close to hills as deeply shadowed. TIREM Version 3 produces unduly optimistic results in such circumstances. Due to the greater accuracy of TIREM Version 4 in the very circumstances which can affect television reception profoundly, we urge the FCC and the NTIA to work together to update Version 3 to produce these more accurate results or to produce a revision of Version 4 for which the source code can be distributed freely.

¹ The NTIA version of TIREM does not include a confidence factor calculation. However, it is not difficult to modify TIREM to include a confidence factor refinement. In fact, Mr. Fast at the ARL was able to accomplish such a modification to TIREM in less than one day. Specifically, Mr. Fast utilized a 90% time variability and a 90% confidence factor. The Longley-Rice coverage maps shown in the NAB reply comment exhibits utilized 50-50-50 factors. The results depicted in NTIA's recent *ex parte* submission also appear to be based on 50% time and 50% confidence factors.

The actual prediction methodology used by the ARL to produce the coverage maps is generally in accord with the prediction methodology proposed by the SBCA in its SHVA comments. Specifically, the ARL used TIREM with a 3" terrain database and high time-reliability and confidence-factor input parameters to predict thresholds of acceptable television field strengths at specific locations. ***The areas shown in purple on the maps represent areas that receive less than a 47 dBu signal. The overlays thus demonstrate that numerous small pockets and larger areas within the Grade A and Grade B areas depicted in pink and green respectively on the NAB's maps do not in fact receive a Grade B signal.***

The ARL prediction methodology differs from the SBCA proposal in the following ways:

- 1) The ARL has produced wide-area overlay maps based upon point-to-point predictions.² Such maps are not required for the purposes of determining individual household eligibility under SHVA. Nonetheless, we have instructed the ARL to produce wide-area maps so that one may easily compare the results of TIREM to the Longley-Rice coverage maps shown in the exhibits to the NAB reply comments. For the reasons discussed above, we believe that the military version of TIREM used by the ARL is more conservative (i.e., it does not over-predict service) than the NTIA version recommended for usage by the SBCA.³ Thus, the enclosed coverage maps are more likely to show reduced coverage areas when compared to the NTIA public version of TIREM.
- 2) The Grade B threshold field-strength values shown on the ARL-generated overlays are the same as those given in the FCC rules, and they are lower than the threshold values proposed by the SBCA. However, we have instructed the ARL to use the present FCC Grade B values in order to facilitate comparison of the TIREM results to the Longley-Rice coverage maps shown in the exhibits to the NAB reply comments.

² Specifically, the market in question was divided into a grid of points separated by one kilometer. The maps reflect the aggregate of a point-to-point examination from the transmitter to each of the one square-kilometer study areas.

³ As noted above, however, SBCA urges the FCC and the NTIA to work together to update the publicly available version of TIREM or to permit the source codes for Version 4 to be publicly distributed.

- 3) The ARL has not included the additional losses due to vegetation and buildings. Again, this makes for easy comparison. However, accounting for the additional losses, by using the USGS land-use and land-cover database, would more accurately depict signal reception using either TIREM or Longley-Rice.

